

the supply nozzle." The Examiner also admits that Brutti does not teach the limitations relating to: (1) having a heating device being connected to the same stainless steel thin wall that is arranged to receive a portion of water from the supply nozzle; and (2) a connection method of the heating device and an end portion of the temperature device to the cup.

To supply the missing feature of (1) above, Li is cited, and Morgandi is cited to provide the missing feature of (2) above.

The rejection is believed to be flawed for at least three reasons, with each reason being set forth below under its respective heading.

CLAIM 1

Brutti does not teach the claimed temperature sensor and its mounting to the stainless steel thin wall

The first reason for traversing the rejection is that the Examiner has speculated regarding the teachings of Brutti, and this speculation cannot take the place of objective facts to support the contention that Brutti teaches specific aspects of the invention. More particularly, Applicants contests the Examiner's view that Brutti teaches the limitation found in claim 1 that "the heating device and an end portion of the temperature sensor is brazed to the stainless steel thin wall of the cup".

In the rejection, thermocouple 56 of Brutti is alleged to be the claimed temperature sensor that is brazed to the stainless steel thin wall of the cup. However, Brutti does not teach this feature. In fact, Brutti, at most, teaches

that the thermocouple 56 is "placed inside the tube", see col. 4, lines 18-20.

The placing of the thermocouple inside the tube does not necessarily mean that the temperature sensor is in contact with the channel or tube wall as assumed by the Examiner. It is just as fair to conclude that the thermocouple 56 extends through the wall forming channel 36, without contacting the channel wall whatsoever. For example, the thermocouple could be separated from the wall with insulation or the like.

Also important to note here is that Brutti teaches that the thermocouple 56 is used for "regulating the temperature of the evaporator apparatus." Applicants submit that this means that the thermocouple 56 is intended to monitor the measurement of the temperature of the vapors flowing between the various channels. Col. 4, lines 27-35 teaches that, with the single heating zone, a positive temperature gradient is obtained along the path of the vapors. It is submitted that this means or at least infers that the temperature of the precursor material in the apparatus is monitored not necessarily the temperature of the wall forming the inner channel 36, whereas the design intent and claim of the Applicant clearly and explicitly point to the desire to monitor the temperature of both the wall and the liquid/steam inside the steam generating cup.

The drawing of Brutti does not give the Examiner grounds to maintain the rejection. The drawing shows no detail regarding the thermocouple and the wall of the channel 36. Without such detail, the Examiner would only be

speculating as to the how the thermocouple and wall of the channel 36 interface. Since the Examiner must first establish a *prima facie* case of obviousness based on objective facts, speculation as to the thermocouple arrangement in Brutti cannot serve as a basis for such a rejection.

The Examiner is also attributing a function to the thermocouple of Brutti without any explicit support in this reference. As stated above, Brutti provides no detail regarding the relationship between the thermocouple and the wall of channel 36, which could be a through hole with or without insulation or the like such that the thermocouple never contacts the channel wall. If Brutti had in mind a specific arrangement wherein the thermocouple would be brazed, welded or otherwise connected to the wall of the channel 36 for the purpose of monitoring the wall temperature, one would think that Brutti would provide such detail. This contrasts with Morgandi, which goes into great detail regarding the thermocouple and its attachment to adjacent feature of the Morgandi heater.

To summarize, Brutti can be fairly interpreted as follows: (1) no guidance is given regarding the relationship between the end of the thermocouple 56 and the wall of the channel 36; (2) there is no express teaching that an end portion of the thermocouple is attached to the stainless steel thin wall, let alone being brazed to the wall; and (3) the thermocouple is mounted to monitor temperature of the vapors flowing in the channel that is regulated. With this, it is submitted that the Examiner does not have the

proper basis to conclude that Brutti teaches the aspect of the claim 1, wherein an end portion of the temperature sensor is attached to the stainless steel thin wall.

Li does not remedy the failing in Brutti regarding the relationship between the temperature sensor and the thin wall

Li cannot supply the deficiency in Brutti in this regard. Li, while similar to Brutti in teaching a CVD apparatus, uses an entirely different technique for treatment of the liquid precursor. In Li, the liquid precursor is "vaporized by heated media disks", see the Abstract, and the disks are "aligned perpendicularly to the flow of the atomized mist," see col. 9, line 30. In Brutti, a series of channels are employed for travel of the precursor liquid, with the channels surrounded by a heater.

Li states in col. 2, lines 45-65, that droplets contacting the wall of the vaporizing device leads to adverse performance and should therefore be avoided. Li avoids this problem by using a curtain gas to prevent the precursor liquid from contacting the cup walls, see col. 5, lines 7-10. Li even goes further by cooling the walls of the vaporizer to prevent premature vaporization of the atomized precursor liquid mist, see col. 11, lines 20-23.

Li's thermocouple 68 is embedded into the housing, and is not anywhere remotely close the wall of the heated part of the apparatus. The thermocouple 32 is to monitor the cooling of the jacket, and is unrelated to monitoring the temperature of the atomized precursor liquid.

Therefore, there is no basis in Li to contend that one of skill in the art would modify the thermocouple of Bruttii so that it meets the limitations of claim 1.

The rejection lacks the proper reasoning to modify Bruttii using the teachings of Li

The Examiner's interpretation of Li to support an obviousness rejection and modification of Bruttii is not supported by the proper reasoning. In the rejection, the Examiner takes the position that, in order to produce the desired vapor quality, the heating device and temperature sensors must be connected to the stainless steel wall that is capable of receiving the supply of fluid. This position is used to support the contention that it would be obvious to use a heating device on the wall of channel 36 of Bruttii.

The problem with this approach is the Examiner's assumption that the teaching regarding the heating device and temperature sensors of Li can be applied equally to the Bruttii apparatus.

Li uses a heating device to heat the media disks that receive the spray of precursor liquid. The housing that supports the heating disks and contains the heating devices is not a thin wall housing and has no similarity to the multiple channel arrangement of Bruttii. Moreover, the manner in which the precursor temperature is controlled is completely different between Bruttii and Li. Whereas Bruttii passes the precursor liquid through a series of channels with a controlled temperature gradient, and has the heating devices in contact with the gases on the last path of their travel, i.e.,

channels 40 and 42, Li passes the gases through a series of heated disks, that are heated by the heaters 62 in the housing. The fact that the heaters 62 are in the housing for heating the media disks in Li does not mean that one of skill in the art would put a heater on the wall of channel 36 that receives the spray of precursor liquid. In fact and as mentioned above, Li does not even use a wall to receive the precursor liquid for heating – Li furthermore teaches measures (curtain gas) to avoid contact between the precursor liquid and the wall – so why would one of skill in the art apply the heating methodology of Li to the entirely different method of Brutti.

All in all, the vast differences between Li and Brutti means that there is no legitimate reason to put a heating device on the wall of channel 36 of Brutti as alleged in the Office Action. The Examiner is speculating at best to formulate the rejection based on Li, and this speculation cannot support a sustainable rejection under 35 U.S.C. § 103(a).

Morgandi's teaching of brazing does not overcome the failings in Brutti and Li.

The Examiner relies on Morgandi to contend that it would be obvious to braze the thermocouple of Brutti on the wall of the channel 36 since brazing is a common form of attachment. Regardless of the teachings of Morgandi, the real question here is what is the relationship between the thermocouple of Brutti and the wall of channel 36. If the thermocouple passes through a hole in the wall to sense the temperature of the vapor in

the channel 36, why braze the thermocouple to the wall? The real inquiry lies with Brutti and as shown above, Brutti lacks the necessary disclosure to draw a conclusion regarding the relationship between the thermocouple and wall, and Morgandi supplies nothing in this regard.

Furthermore, Morgandi is unrelated to CVD apparatus, and it is submitted that one of skill in the art would not look to the attachment of Morgandi's thermocouple to the heating rod to modify the arrangement of the thermocouple 56 in the wall of channel 36 of Brutti. Again, the Examiner is applying hindsight to formulate the rejection without the proper objective basis to do so.

Even if the Examiner were to contend that Morgandi teaches that the thermocouple of Brutti could be brazed to the wall of channel 36, the rejection still fails due to argument made above regarding Li.

CLAIM 3

As with claim 1, the Examiner speculates as to the attachment of the thermocouple of Brutti and the wall of the channel 36. Claim 3 defines a specific arrangement of the temperature sensor, its side and tip, and there is absolutely no explicit teaching of this arrangement in Brutti. The Figure 1 drawing shows that the thermocouple passes through the wall, but there is no disclosure as to how the wall and thermocouple interface and no inference can be made from the cross-sectional nature of the drawing. To say that the thermocouple is directly connected to the wall of channel 36 is

not supported by objective evidence in the form of a written description of detailed drawing. As noted above, it is equally plausible that the thermocouple merely passes through an opening in the wall. Thus, the claim limitation that the side of the tip directly contacts the wall is not necessarily the case in Brutti and to allege anticipation is improper.

The arguments set forth below for claim 18 equally apply for claim 3 regarding the arrangement of the thermocouple.

CLAIM 6

Claim 6 is believed to be patentable for the same reasons as claim 1, i.e., the rejection alleging that Brutti teaches the relationship between the thermocouple and thin wall is speculative at best.

Secondly, the allegation that Morgandi teaches forming a stud in the bottom of the cup of Brutti to provide passage for a thermocouple sensor is also flawed. In the rejection, the Examiner considers the end pieces of boiler 5 to be studs that allow for passage of the thermocouple 12A into the boiler chamber. Even, *assuming arguendo*, that the ends of the boiler 5 could be brazed in Morgandi, the real question is whether one of skill in the art would modify Brutti to include a brazed "stud" on the bottom of the cup to provide passage of the thermocouple 56. There is no reason to provide an entrance on the bottom of the tube 34 of Brutti to bring the thermocouple 56 into its desired location. Morgandi does not provide such a reason since

Morgandi is far afield from the CVD apparatus of Brutti. The Examiner has not provided a legitimate reason to modify Brutti. Instead, the Examiner has plucked the particular mounting arrangement of a thermocouple for a boiler in Morgandi and tried to shoehorn it into the totally unrelated apparatus of Brutti. At best, this is hindsight and this approach could not be sustained on appeal. Therefore, the rejection of claim 6 is also flawed and must be withdrawn.

CLAIM 18

Claim 18, among other things, differs from claim 1 in requiring that the thermocouple is brazed to the inside side wall of the cup. As with the previous claims, the Examiner interprets Brutti to teach this arrangement. However, there is no explicit disclosure that the thermocouple is attached along the inside wall of channel 36 of Brutti and the contention that Brutti teaches this aspect of claim 18 is improper.

It is also argued here that Brutti does not teach anything more than monitoring the temperature of the precursor material to insure the positive temperature gradient exists. With this suggestion, why would one of skill in the art be urged to arrange the thermocouple so that a side of the tip of the thermocouple contacts an inside wall of channel wall 36, while leaving the tip exposed as is required by claim 18?

Even if the Examiner were to insist that the thermocouple 36 could be brazed to the channel wall, where is the reasoning for contending that the side of the thermocouple would have direct contact with the inside wall of the channel? To make such an allegation is not based on the teachings of the prior art, only speculation on the Examiner's part. At best, the side of the thermocouple could be brazed to the inside of the hole in the channel wall, but not in direct contact with the inside wall of the channel receiving the precursor spray.

Morgandi does not remedy this deficiency in Brutti. While Morgandi may suggest that the thermocouple is brazed to the heater, this alone does not lead one of skill in the art to the modification of Brutti proposed in the rejection.

PREAMBLE

Each of claims 1, 6, and 18 define a steam on demand generator having the following components:

- a heating device for heating the cup assembly and an interior thereof;
- a water injection device for supplying water to the cup assembly;
- a steam outlet; and
- a temperature sensor positioned within the cup assembly, wherein water is supplied in quantities so that the interior of the cup assembly remains essentially dry during steam generation.

In rejecting each of the independent claims, the Examiner has taken the position that the CVD apparatus of Brutti is the same as the claimed steam on demand generator. Applicants submit that this approach is flawed for two reasons. First, the Examiner cannot ignore the preamble language since it limits the structure of the claim. Applicants are not merely claiming an evaporator device that includes a liquid injection means. To the contrary, the invention relates to improvements in steam generators and Applicants have limited their claims to this genre of devices. Since the preamble must be addressed by the Examiner as a limiting aspect of the claim, the question remains as to whether Brutti teaches a steam on demand generator having the claimed components. The answer to this question is clearly no; Brutti does not teach a steam on demand generator. Brutti teaches a particular type of liquid precursor evaporator as an antecedent to a chemical vapor deposition apparatus. This apparatus cannot be said to be a steam on demand generator and cannot anticipate claims 1, 6, and 18 for this reason.

Lacking a teaching of a steam on demand generator having the claimed components, the Examiner must say that it would be obvious to modify the apparatus of Brutti for use as a steam on demand generator. In order to make this modification, the Examiner must have a reason to do so, but no such reason exists. Brutti goes through elaborate measures to ensure that total evaporation of the precursor liquid occurs, i.e., the use of a tortuous flow path, see col. 3, lines 37-43. Brutti also supplies a vector gas

to make sure that evaporation products do not condense on the sides of the walls, see col. 4, lines 51-54. With these elaborate measures, why would one of skill in the art use the evaporator of Brutti for the simple task of heating water to generate steam? This would be akin to investigating the technology of jet engines when seeking to produce an improved car engine because both engine technologies involve the combustion of hydrocarbons. To assert obviousness on this issue would be the inexcusable application of hindsight, using Applicants' invention as the supporting teaching. Since this practice is impermissible under patent law, the rejection based on the CVD apparatus of Brutti is fatally flawed.

SUMMARY

In light of the arguments made above, each of claims 1, 3, 6, and 18 are patentable over the applied prior art on the basis that the Examiner has failed to establish a *prima facie* case of anticipation or obviousness. The remaining dependent claims are in condition for allowance by reason of their dependency.

Accordingly, the Examiner is requested to examine this application in light of this response and pass claims 1-3 and 5-7 and 18 onto issuance.

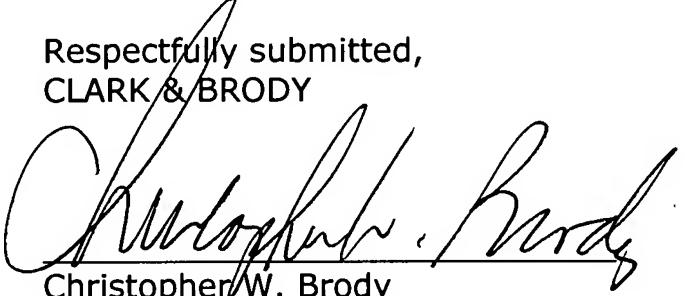
If the Examiner believes that an interview would be helpful in expediting the allowance of this application, the Examiner is requested to telephone the undersigned at 202-835-1753.

The above constitutes a complete response to all issues raised in the Office Action dated June 13, 2007.

Again, reconsideration and allowance of this application is respectfully requested.

Applicants respectfully submit that there is no fee required for this submission, however, please charge any fee deficiency or credit any overpayment to Deposit Account No. 50-1088.

Respectfully submitted,
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